



1589.0160001Seq. Listing.txt
SEQUENCE LISTING

<110> Wild et al.

<120> Methods of Eliciting Broadly Neutralizing Antibodies
Targeting HIV-1 gp41

<130> 1589.0160001

<140>

<141>

<160> 84

<170> PatentIn Ver. 2.1

<210> 1

<211> 55

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 1

Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu
1 5 10 15

Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly
20 25 30

Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys
35 40 45

Asp Gln Gln Leu Leu Gly Ile
50 55

<210> 2

<211> 38

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 2

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15

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Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu
 20 25 30

Arg Tyr Leu Lys Asp Gln
 35

<210> 3
 <211> 36
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 3
 Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30

Ala Arg Ile Leu
 35

<210> 4
 <211> 56
 <212> PRT
 <213> Human immunodeficiency virus

<400> 4
 Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr
 1 5 10 15

Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu
 20 25 30

Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp
 35 40 45

Asn Trp Phe Asn Ile Thr Asn Trp
 50 55

<210> 5
 <211> 36

1589.0160001Seq. Listing.txt

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 5

Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 6

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 6

Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His
1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
20 25 30

Leu Leu

<210> 7

<211> 5

<212> DNA

<213> Artificial Sequence

<220>

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<400> 7

ggggs

5

<210> 8

<211> 345

1589.0160001Seq. Listing.txt

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 8

Ala	Val	Gly	Ile	Gly	Ala	Leu	Phe	Leu	Gly	Phe	Leu	Gly	Ala	Ala	Gly	1	5	10	15
Ser	Thr	Met	Gly	Ala	Arg	Ser	Met	Thr	Leu	Thr	Val	Gln	Ala	Arg	Gln	20	25	30	
Leu	Leu	Ser	Gly	Ile	Val	Gln	Gln	Gln	Asn	Asn	Leu	Leu	Arg	Ala	Ile	35	40	45	
Glu	Ala	Gln	Gln	His	Leu	Leu	Gln	Leu	Thr	Val	Trp	Gly	Ile	Lys	Gln	50	55	60	
Leu	Gln	Ala	Arg	Ile	Leu	Ala	Val	Glu	Arg	Tyr	Leu	Lys	Asp	Gln	Gln	65	70	75	80
Leu	Leu	Gly	Ile	Trp	Gly	Cys	Ser	Gly	Lys	Leu	Ile	Cys	Thr	Thr	Ala	85	90	95	
Val	Pro	Trp	Asn	Ala	Ser	Trp	Ser	Asn	Lys	Ser	Leu	Glu	Gln	Ile	Trp	100	105	110	
Asn	Asn	Met	Thr	Trp	Met	Glu	Trp	Asp	Arg	Glu	Ile	Asn	Asn	Tyr	Thr	115	120	125	
Ser	Leu	Ile	His	Ser	Leu	Ile	Glu	Glu	Ser	Gln	Asn	Gln	Gln	Glu	Lys	130	135	140	
Asn	Glu	Gln	Glu	Leu	Leu	Glu	Leu	Asp	Lys	Trp	Ala	Ser	Leu	Trp	Asn	145	150	155	160
Trp	Phe	Asn	Ile	Thr	Asn	Trp	Leu	Trp	Tyr	Ile	Lys	Ile	Phe	Ile	Met	165	170	175	
Ile	Val	Gly	Gly	Leu	Val	Gly	Leu	Arg	Ile	Val	Phe	Ala	Val	Leu	Ser	180	185	190	
Ile	Val	Asn	Arg	Val	Arg	Gln	Gly	Tyr	Ser	Pro	Leu	Ser	Phe	Gln	Thr	195	200	205	
His	Leu	Pro	Thr	Pro	Arg	Gly	Pro	Asp	Arg	Pro	Glu	Gly	Ile	Glu	Glu	210	215	220	
Glu	Gly	Gly	Glu	Arg	Asp	Arg	Asp	Arg	Ser	Ile	Arg	Leu	Val	Asn	Gly	225	230	235	240

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Ser Leu Ala Leu Ile Trp Asp Asp Leu Arg Ser Leu Cys Leu Phe Ser
      245                                250                                255

Tyr His Arg Leu Arg Asp Leu Leu Leu Ile Val Thr Arg Ile Val Glu
      260                                265                                270

Leu Leu Gly Arg Arg Gly Trp Glu Ala Leu Lys Tyr Trp Trp Asn Leu
      275                                280                                285

Leu Gln Tyr Trp Ser Gln Glu Leu Lys Asn Ser Ala Val Ser Leu Leu
      290                                295                                300

Asn Ala Thr Ala Ile Ala Val Ala Glu Gly Thr Asp Arg Val Ile Glu
305                                310                                315                                320

Val Val Gln Gly Ala Cys Arg Ala Ile Arg His Ile Pro Arg Arg Ile
      325                                330                                335

Arg Gln Gly Leu Glu Arg Ile Leu Leu
      340                                345

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<210> 9
<211> 45
<212> PRT
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence:Synthetic

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<400> 9
Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
  1                                5                                10                                15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
      20                                25                                30

Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln
      35                                40                                45

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<210> 10
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<212> PRT
<213> Artificial Sequence

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<220>

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<223> Description of Artificial Sequence:Synthetic

<400> 10

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30

Ala Arg Val Leu Ala Leu Glu Arg Tyr Leu Arg Asp Gln
 35 40 45

<210> 11

<211> 36

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Synthetic

<400> 11

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30

Ala Arg Val Leu
 35

<210> 12

<211> 38

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 12

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
 1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu
 20 25 30

Arg Tyr Leu Arg Asp Gln

35

<210> 13
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 <212> PRT
 <213> Artificial Sequence

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 <223> Description of Artificial Sequence:Synthetic

<400> 13
 Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15
 Gln Gln Arg Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30
 Ala Arg Val Leu Ala Val Glu Arg Tyr Leu Gly Asp Gln
 35 40 45

<210> 14
 <211> 36
 <212> PRT
 <213> Artificial Sequence

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 <223> Description of Artificial Sequence:Synthetic

<400> 14
 Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15
 Gln Gln Arg Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30
 Ala Arg Val Leu
 35

<210> 15
 <211> 38
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<220>
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1589.0160001Seq. Listing.txt

<400> 15

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln Arg Met Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
20 25 30

Arg Tyr Leu Gly Asp Gln
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<210> 16

<211> 45

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Synthetic

<400> 16

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Leu Glu Arg Tyr Leu Arg Asp Gln
35 40 45

<210> 17

<211> 36

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Synthetic

<400> 17

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu
35

1589.0160001Seq. Listing.txt

<210> 18
<211> 38
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 18
Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Met Leu Gln Leu
1 5 10 15
Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu
20 25 30
Arg Tyr Leu Arg Asp Gln
35

<210> 19
<211> 45
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 19
Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15
Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30
Ala Arg Val Leu Ala Ile Glu Arg Tyr Leu Arg Asp Gln
35 40 45

<210> 20
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

1589.0160001Seq. Listing.txt

<400> 20

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu
35

<210> 21

<211> 38

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Synthetic

<400> 21

Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Met Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Ile Glu
20 25 30

Arg Tyr Leu Arg Asp Gln
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<210> 22

<211> 45

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 22

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Val Glu Ser Tyr Leu Lys Asp Gln
35 40 45

1589.0160001Seq. Listing.txt

<210> 23
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 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 23
 Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
 1 5 10 15
 Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
 20 25 30
 Ser Tyr Leu Lys Asp Gln
 35

<210> 24
 <211> 45
 <212> PRT
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 <223> Description of Artificial Sequence:Synthetic

<400> 24
 Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15
 Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30
 Ala Arg Val Leu Ala Val Glu Arg Tyr Leu Gln Asp Gln
 35 40 45

<210> 25
 <211> 36
 <212> PRT
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<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 25

1589.0160001Seq. Listing.txt

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu
35

<210> 26

<211> 38

<212> PRT

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<400> 26

Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
20 25 30

Arg Tyr Leu Gln Asp Gln
35

<210> 27

<211> 45

<212> PRT

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<223> Description of Artificial Sequence:Synthetic

<400> 27

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Leu Glu Arg Tyr Leu Arg Asp Gln
35 40 45

1589.0160001Seq. Listing.txt

<210> 28

<211> 38

<212> PRT

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<223> Description of Artificial Sequence:Synthetic

<400> 28

Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu
20 25 30

Arg Tyr Leu Arg Asp Gln
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<210> 29

<211> 45

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Synthetic

<400> 29

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Gln Ala
1 5 10 15

Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Val Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40 45

<210> 30

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 30

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Gln Ala

1589.0160001Seq. Listing.txt

1	5	10	15
Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Val Lys Gln Leu Gln			
20	25	30	

Ala Arg Val Leu
35

<210> 31
<211> 38
<212> PRT
<213> Artificial Sequence

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<223> Description of Artificial Sequence:Synthetic

<400> 31
Ser Asn Leu Leu Arg Ala Ile Gln Ala Gln Gln His Met Leu Gln Leu
1 5 10 15
Thr Val Trp Gly Val Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
20 25 30

Arg Tyr Leu Lys Asp Gln
35

<210> 32
<211> 45
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 32
Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Lys Ala Ile Glu Ala
1 5 10 15
Gln Gln His Leu Leu Lys Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40 45

<210> 33

1589.0160001Seq. Listing.txt

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 33

Ser	Gly	Ile	Val	Gln	Gln	Gln	Ser	Asn	Leu	Leu	Lys	Ala	Ile	Glu	Ala
1				5					10					15	

Gln	Gln	His	Leu	Leu	Lys	Leu	Thr	Val	Trp	Gly	Ile	Lys	Gln	Leu	Gln
			20					25					30		

Ala	Arg	Val	Leu
			35

<210> 34

<211> 38

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Synthetic

<400> 34

Ser	Asn	Leu	Leu	Lys	Ala	Ile	Glu	Ala	Gln	Gln	His	Leu	Leu	Lys	Leu
1				5					10					15	

Thr	Val	Trp	Gly	Ile	Lys	Gln	Leu	Gln	Ala	Arg	Val	Leu	Ala	Val	Glu
			20					25					30		

Arg	Tyr	Leu	Lys	Asp	Gln
					35

<210> 35

<211> 45

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 35

Ser	Gly	Ile	Val	Gln	Gln	Gln	Asn	Ile	Leu	Leu	Arg	Ala	Ile	Glu	Ala
1				5					10					15	

1589.0160001Seq. Listing.txt

Gln Gln His Leu Leu Gln Leu Ser Ile Trp Gly Ile Lys Gln Leu Gln
 20 25 30

Ala Lys Val Leu Ala Ile Glu Arg Tyr Leu Arg Asp Gln
 35 40 45

<210> 36

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 36

Ser Gly Ile Val Gln Gln Gln Asn Ile Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15

Gln Gln His Leu Leu Gln Leu Ser Ile Trp Gly Ile Lys Gln Leu Gln
 20 25 30

Ala Lys Val Leu
 35

<210> 37

<211> 38

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 37

Asn Ile Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
 1 5 10 15

Ser Ile Trp Gly Ile Lys Gln Leu Gln Ala Lys Val Leu Ala Ile Glu
 20 25 30

Arg Tyr Leu Arg Asp Gln
 35

<210> 38

<211> 45

1589.0160001Seq. Listing.txt

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 38

Lys Gly Ile Val Gln Gln Gln Asp Asn Leu Leu Arg Ala Ile Gln Ala
1 5 10 15

Gln Gln Gln Leu Leu Arg Leu Ser Xaa Trp Gly Ile Arg Gln Leu Arg
20 25 30

Ala Arg Leu Leu Ala Leu Glu Thr Leu Leu Gln Asn Gln
35 40 45

<210> 39

<211> 35

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 39

Lys Gly Ile Val Gln Gln Gln Asp Asn Leu Leu Arg Ala Ile Gln Ala
1 5 10 15

Gln Gln Gln Leu Leu Arg Leu Ser Xaa Trp Gly Ile Arg Gln Leu Arg
20 25 30

Ala Arg Leu
35

<210> 40

<211> 38

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 40

Asp Asn Leu Leu Arg Ala Ile Gln Ala Gln Gln Gln Leu Leu Arg Leu
1 5 10 15

1589.0160001Seq. Listing.txt

Ser Xaa Trp Gly Ile Arg Gln Leu Arg Ala Arg Leu Leu Ala Leu Glu
 20 25 30

Thr Leu Leu Gln Asn Gln
 35

<210> 41
 <211> 46
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 41
 Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His
 1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
 20 25 30

Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
 35 40 45

<210> 42
 <211> 46
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 42
 Trp Met Glu Trp Glu Arg Glu Ile Glu Asn Tyr Thr Gly Leu Ile Tyr
 1 5 10 15

Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Asp
 20 25 30

Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
 35 40 45

<210> 43
 <211> 34
 <212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 43

Trp Met Glu Trp Glu Arg Glu Ile Glu Asn Tyr Thr Gly Leu Ile Tyr
1 5 10 15

Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Asp
20 25 30

Leu Leu

<210> 44

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 44

Tyr Thr Gly Leu Ile Tyr Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Asp Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 45

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 45

Trp Met Glu Trp Glu Arg Glu Ile Asp Asn Tyr Thr Ser Glu Ile Tyr
1 5 10 15

Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu

1589.0160001Seq. Listing.txt

20 25 30

Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40 45

<210> 46

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 46

Trp Met Glu Trp Glu Arg Glu Ile Asp Asn Tyr Thr Ser Glu Ile Tyr
1 5 10 15

Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
20 25 30

Leu Leu

<210> 47

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 47

Tyr Thr Ser Glu Ile Tyr Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 48

<211> 46

<212> PRT

<213> Artificial Sequence

1589.0160001Seq. Listing.txt

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 48

Trp Met Glu Trp Glu Arg Glu Ile Asp Asn Tyr Thr Asp Tyr Ile Tyr
1 5 10 15

Asp Leu Leu Glu Lys Ser Gln Thr Gln Gln Glu Lys Asn Glu Lys Glu
20 25 30

Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40 45

<210> 49

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 49

Trp Met Glu Trp Glu Arg Glu Ile Asp Asn Tyr Thr Asp Tyr Ile Tyr
1 5 10 15

Asp Leu Leu Glu Lys Ser Gln Thr Gln Gln Glu Lys Asn Glu Lys Glu
20 25 30

Leu Leu

<210> 50

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 50

Tyr Thr Asp Tyr Ile Tyr Asp Leu Leu Glu Lys Ser Gln Thr Gln Gln
1 5 10 15

Glu Lys Asn Glu Lys Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

1589.0160001Seq. Listing.txt

Trp Asn Trp Phe
35

<210> 51
<211> 46
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 51
Trp Ile Gln Trp Asp Arg Glu Ile Ser Asn Tyr Thr Gly Ile Ile Tyr
1 5 10 15
Arg Leu Leu Glu Glu Ser Gln Asn Gln Gln Glu Asn Asn Glu Lys Asp
20 25 30
Leu Leu Ala Leu Asp Lys Trp Gln Asn Leu Trp Ser Trp Phe
35 40 45

<210> 52
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 52
Trp Ile Gln Trp Asp Arg Glu Ile Ser Asn Tyr Thr Gly Ile Ile Tyr
1 5 10 15
Arg Leu Leu Glu Glu Ser Gln Asn Gln Gln Glu Asn Asn Glu Lys Asp
20 25 30
Leu Leu

<210> 53
<211> 36
<212> PRT
<213> Artificial Sequence

1589.0160001Seq. Listing.txt

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 53

Tyr Thr Gly Ile Ile Tyr Arg Leu Leu Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Asn Asn Glu Lys Asp Leu Leu Ala Leu Asp Lys Trp Gln Asn Leu
20 25 30

Trp Ser Trp Phe
35

<210> 54

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 54

Trp Met Glu Trp Glu Arg Glu Ile Ser Asn Tyr Thr Gly Leu Ile Tyr
1 5 10 15

Asp Leu Ile Glu Glu Ser Gln Ile Gln Gln Glu Lys Asn Glu Lys Asp
20 25 30

Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40 45

<210> 55

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 55

Trp Met Glu Trp Glu Arg Glu Ile Ser Asn Tyr Thr Gly Leu Ile Tyr
1 5 10 15

Asp Leu Ile Glu Glu Ser Gln Ile Gln Gln Glu Lys Asn Glu Lys Asp
20 25 30

Leu Leu

<210> 56
 <211> 36
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 56
 Tyr Thr Gly Leu Ile Tyr Asp Leu Ile Glu Glu Ser Gln Ile Gln Gln
 1 5 10 15

Glu Lys Asn Glu Lys Asp Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
 20 25 30

Trp Asn Trp Phe
 35

<210> 57
 <211> 46
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 57
 Trp Met Glu Trp Gln Lys Glu Ile Ser Asn Tyr Ser Asn Glu Val Tyr
 1 5 10 15

Arg Leu Ile Glu Lys Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Gly
 20 25 30

Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
 35 40 45

<210> 58
 <211> 34
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 58

Trp Met Glu Trp Gln Lys Glu Ile Ser Asn Tyr Ser Asn Glu Val Tyr
1 5 10 15

Arg Leu Ile Glu Lys Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Gly
20 25 30

Leu Leu

<210> 59

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 59

Tyr Ser Asn Glu Val Tyr Arg Leu Ile Glu Lys Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Gly Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 60

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 60

Trp Ile Gln Trp Asp Arg Glu Ile Ser Asn Tyr Thr Gln Gln Ile Tyr
1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Asp
20 25 30

Leu Leu Ala Leu Asp Asn Trp Ala Ser Leu Trp Thr Trp Phe

35

40

45

<210> 61
 <211> 34
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 61
 Trp Ile Gln Trp Asp Arg Glu Ile Ser Asn Tyr Thr Gln Gln Ile Tyr
 1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Asp
 20 25 30

Leu Leu

<210> 62
 <211> 36
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 62
 Tyr Thr Gln Gln Ile Tyr Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
 1 5 10 15

Glu Lys Asn Glu Gln Asp Leu Leu Ala Leu Asp Asn Trp Ala Ser Leu
 20 25 30

Trp Thr Trp Phe
 35

<210> 63
 <211> 46
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

1589.0160001Seq. Listing.txt

<400> 63

Trp Met Glu Trp Asp Arg Gln Ile Asp Asn Tyr Thr Glu Val Ile Tyr
1 5 10 15

Arg Leu Leu Glu Leu Ser Gln Thr Gln Gln Glu Gln Asn Glu Gln Asp
20 25 30

Leu Leu Ala Leu Asp Lys Trp Asp Ser Leu Trp Asn Trp Phe
35 40 45

<210> 64

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 64

Trp Met Glu Trp Asp Arg Gln Ile Asp Asn Tyr Thr Glu Val Ile Tyr
1 5 10 15

Arg Leu Leu Glu Leu Ser Gln Thr Gln Gln Glu Gln Asn Glu Gln Asp
20 25 30

Leu Leu

<210> 65

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 65

Tyr Thr Glu Val Ile Tyr Arg Leu Leu Glu Leu Ser Gln Thr Gln Gln
1 5 10 15

Glu Gln Asn Glu Gln Asp Leu Leu Ala Leu Asp Lys Trp Asp Ser Leu
20 25 30

Trp Asn Trp Phe
35

1589.0160001Seq. Listing.txt

<210> 66
<211> 47
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 66
Trp Ile Gln Trp Glu Arg Glu Ile Asn Asn Tyr Thr Gly Ile Ile Tyr
1 5 10 15
Ser Leu Ile Glu Glu Ala Gln Asn Gln Gln Glu Asn Asn Glu Lys Asp
20 25 30
Leu Leu Ala Leu Asp Lys Trp Thr Asn Leu Trp Asn Trp Phe Asn
35 40 45

<210> 67
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 67
Trp Ile Gln Trp Glu Arg Glu Ile Asn Asn Tyr Thr Gly Ile Ile Tyr
1 5 10 15
Ser Leu Ile Glu Glu Ala Gln Asn Gln Gln Glu Asn Asn Glu Lys Asp
20 25 30
Leu Leu

<210> 68
<211> 37
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

1589.0160001Seq. Listing.txt

<400> 68

Tyr Thr Gly Ile Ile Tyr Ser Leu Ile Glu Glu Ala Gln Asn Gln Gln
1 5 10 15

Glu Asn Asn Glu Lys Asp Leu Leu Ala Leu Asp Lys Trp Thr Asn Leu
20 25 30

Trp Asn Trp Phe Asn
35

<210> 69

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 69

Trp Gln Gln Trp Asp Glu Lys Val Arg Asn Tyr Ser Gly Val Ile Phe
1 5 10 15

Gly Leu Ile Glu Gln Ala Gln Glu Gln Gln Asn Thr Asn Glu Lys Ser
20 25 30

Leu Leu Glu Leu Asp Gln Trp Asp Ser Leu Trp Ser Trp Phe
35 40 45

<210> 70

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic

<400> 70

Trp Gln Gln Trp Asp Glu Lys Val Arg Asn Tyr Ser Gly Val Ile Phe
1 5 10 15

Gly Leu Ile Glu Gln Ala Gln Glu Gln Gln Asn Thr Asn Glu Lys Ser
20 25 30

Leu Leu

1589.0160001Seq. Listing.txt

<210> 71
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 71
Tyr Ser Gly Val Ile Phe Gly Leu Ile Glu Gln Ala Gln Glu Gln Gln
1 5 10 15
Asn Thr Asn Glu Lys Ser Leu Leu Glu Leu Asp Gln Trp Asp Ser Leu
20 25 30
Trp Ser Trp Phe
35

<210> 72
<211> 46
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 72
Trp Gln Glu Trp Asp Arg Gln Ile Ser Asn Ile Ser Ser Thr Ile Tyr
1 5 10 15
Glu Glu Ile Gln Lys Ala Gln Val Gln Gln Glu Gln Asn Glu Lys Lys
20 25 30
Leu Leu Glu Leu Asp Glu Trp Ala Ser Ile Trp Asn Trp Leu
35 40 45

<210> 73
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 73

1589.0160001Seq. Listing.txt

Trp Gln Glu Trp Asp Arg Gln Ile Ser Asn Ile Ser Ser Thr Ile Tyr
1 5 10 15

Glu Glu Ile Gln Lys Ala Gln Val Gln Gln Glu Gln Asn Glu Lys Lys
20 25 30

Leu Leu

<210> 74
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 74
Ile Ser Ser Thr Ile Tyr Glu Glu Ile Gln Lys Ala Gln Val Gln Gln
1 5 10 15

Glu Gln Asn Glu Lys Lys Leu Leu Glu Leu Asp Glu Trp Ala Ser Ile
20 25 30

Trp Asn Trp Leu
35

<210> 75
<211> 465
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (34)..(357)

<220>
<223> Description of Artificial Sequence:Synthetic

<400> 75
agcgggtgcgc cgaaagtacg cgctaagctt cat atg ggt att gtt cag cag cag 54

Met Gly Ile Val Gln Gln Gln
1 5

aac aat ttg ctg agg gct att gag gcg caa cag cac ctg ctg cag ctg 102

1589.0160001Seq. Listing.txt

```

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
  10                      15                      20

acc gta tgg ggc atc aag cag ctg cag gca cgc atc ctg gct gtt gaa 150

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu
  25                      30                      35

cgc tac ctg aag gat caa ggc ggc ggc tca ggc gcc ggc tca gag tgg 198

Arg Tyr Leu Lys Asp Gln Gly Gly Gly Ser Gly Ala Gly Ser Glu Trp
  40                      45                      50                      55

gac aga gaa att aac aat tac aca agc tta ata cac tcc tta att gaa 246

Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu
                      60                      65                      70

gaa tcg caa aac cag caa gaa aag aat gaa caa gaa tta ttg gaa tta 294

Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu
                      75                      80                      85

gat aaa tgg gca agt ttg tgg aat tgg ttt gaa ttc atc gat gat atc 342

Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe Glu Phe Ile Asp Asp Ile
  90                      95                      100

aga tcc ggc tgc taa caaagcccga aaggaagctg agtttggtg ctgccacccg 397

Arg Ser Gly Cys
  105

ctgagcaata actagcataa ccccttgggg gcctctaaac gggctcttgag gggttttttg 457

cttgaaag 465

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<210> 76
<211> 107
<212> PRT
<213> Artificial Sequence
<223> Description of Artificial Sequence:Synthetic

<400> 76

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1589.0160001Seq. Listing.txt

```

Met Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
 1           5           10           15
Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
          20           25           30
Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gly Gly Gly
          35           40           45
Ser Gly Ala Gly Ser Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser
          50           55           60
Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn
          65           70           75           80
Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp
          85           90           95
Phe Glu Phe Ile Asp Asp Ile Arg Ser Gly Cys
          100          105

```

<210> 77
 <211> 197
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

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<400> 77
gagggactat atccggttat tcacaaggac ggctgtgggc gccatgatcg cgtagtcgat 60
agtggctcca agtaaccgga agcgacaggg actgtgccgg gcgccaaagg cggtcgacag 120
tgctttctag aaccgggtgc gcataaaaat gcatacacgcc tatagcgcta gagccgctgc 180
attaaatgaa tcggcca                                     197

```

<210> 78
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

```

<400> 78
Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
 1           5           10           15

```

Glu Lys

<210> 79
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 79
 Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu
 1 5 10 15

Leu Asp

<210> 80
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 80
 Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
 1 5 10

<210> 81
 <211> 26
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 81
 Gly Gly Gly Cys Cys Cys Ala Thr Ala Thr Gly Gly Gly Thr Ala Thr
 1 5 10 15

Thr Gly Thr Thr Cys Ala Gly Cys Ala Gly
 20 25

1589.0160001Seq. Listing.txt

<210> 82
 <211> 44
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 82
 Gly Gly Gly Cys Cys Gly Gly Cys Gly Cys Cys Thr Gly Ala Gly Cys
 1 5 10 15
 Cys Gly Cys Cys Gly Cys Cys Thr Thr Gly Ala Thr Cys Cys Thr Thr
 20 25 30
 Cys Ala Gly Gly Thr Ala Gly Cys Gly Thr Thr Cys
 35 40

<210> 83
 <211> 44
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 83
 Gly Gly Gly Cys Cys Gly Gly Cys Gly Cys Cys Gly Gly Cys Thr Cys
 1 5 10 15
 Ala Gly Ala Gly Thr Gly Gly Gly Ala Cys Ala Gly Ala Gly Ala Ala
 20 25 30
 Ala Thr Thr Ala Ala Cys Ala Ala Thr Thr Ala Cys
 35 40

<210> 84
 <211> 41
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic

<400> 84

1589.0160001Seq. Listing.txt

Gly	Gly	Gly	Cys	Cys	Gly	Ala	Ala	Thr	Thr	Cys	Thr	Thr	Ala	Ala	Ala
1				5					10					15	
Ala	Cys	Cys	Ala	Ala	Thr	Thr	Cys	Cys	Ala	Cys	Ala	Ala	Ala	Cys	Thr
			20					25					30		
Thr	Gly	Cys	Cys	Cys	Ala	Thr	Thr	Thr							
		35						40							